

WHAT IS CLAIMED IS:

1. An audio system that reproduces contents information as sound in a vehicle, comprising:

portable audio apparatus carried by a passenger of  
5 said vehicle; and

an audio apparatus mounted in said vehicle;

wherein said portable audio apparatus comprises:

a contents information storage medium for retaining contents information; and

10 a transmission module for transmitting said contents information to said audio apparatus at least by means of radio communication,

wherein said audio apparatus comprises:

a reception module for receiving said contents  
15 information from said portable audio apparatus by means of radio communication;

a storage medium for storing said contents information received by said reception module; and

a control unit for reproducing said contents  
20 information stored in said storage medium and outputting the reproduced information as sound from speakers mounted in said vehicle.

2. The audio system according to claim 1, wherein said audio apparatus further comprises a detection unit for  
25 detecting whether a passenger of said vehicle has gotten off the vehicle or not, and

said control unit includes an erasure module for erasing information stored in said storage medium according to the detection by said detection unit that a passenger of said vehicle has gotten off the vehicle.

- 5 3. The audio system according to claim 1, wherein said audio apparatus further comprises a detection unit for detecting that said portable audio apparatus has been carried out of said vehicle, and

10 said control unit includes an erasure module for erasing information stored in said storage medium according to the detection by said detection unit that said portable audio apparatus has been carried out of the vehicle.

4. The audio system according to claim 1, wherein said audio apparatus further comprises a detection unit for  
15 detecting ignition OFF of said vehicle,

said control unit includes an erasure module for erasing information stored in said storage medium according to the detection by said detection unit of ignition OFF of said vehicle.

- 20 5. The audio system according to claim 1, wherein said audio apparatus identifies said portable audio apparatus that exists in a predetermined radio communication area of said audio apparatus and further comprises a system construction unit for constructing a radio communication  
25 system made up of the identified portable audio apparatus and said audio apparatus, and

said audio apparatus acquires said contents information from the portable audio apparatus identified by said system construction unit.

6. The audio system according to claim 2, wherein said  
5 control unit further includes a checking module for checking whether information stored in said storage medium has been erased by said erasure module or not, and

said erasure module, when the erasure is not confirmed by said checking module, erases information  
10 stored in said storage medium again.

7. The audio system according to claim 3, wherein said control unit further includes a checking module for checking whether information stored in said storage medium has been erased by said erasure module or not, and

15 said erasure module, when the erasure is not confirmed by said checking module, erases information stored in said storage medium again.

8. The audio system according to claim 5, wherein said audio apparatus further comprises a second man-machine  
20 interface that can instruct simultaneous reproduction of a plurality of contents information pieces when the plurality of contents information pieces is received from a plurality of portable audio apparatuses identified by said system construction unit, and

25 said control unit, when simultaneous reproduction is instructed by said second man-machine interface, outputs at least one contents information piece from among the

plurality of contents information whose simultaneous reproduction is instructed from said speakers and remotely controls said plurality of portable audio apparatuses so that other contents information pieces are reproduced by  
5 at least one of the plurality of portable audio apparatuses identified by said system construction unit.

9. An audio system that reproduces contents information as sound in a vehicle, comprising:

10 a portable audio apparatus carried by a passenger of said vehicle; and

an audio apparatus mounted in said vehicle,

wherein said portable audio apparatus comprises:

a storage medium for retaining contents information and its title information associated with each other;

15 title information transmission modules for transmitting the title information associated with said contents information to said audio apparatus at least by means of radio communication; and

20 contents information transmission modules for transmitting the contents information corresponding to the title information received from said audio apparatus to said audio apparatus at least by means of radio communication,

wherein said audio apparatus comprises:

25 title information reception module for receiving said title information from said portable audio apparatus at least by means of radio communication;

a storage medium for storing said title information received by said title information reception module;

a man-machine interface for notifying titles in said vehicle according to said title information stored in said storage medium and allowing the passenger of said vehicle to select contents information to be received from said portable audio apparatus with reference to the notified titles;

request transmission module for transmitting the title information corresponding to the titles selected by said man-machine interface to said portable audio apparatus at least by means of radio communication in order to request for the transmission of contents information corresponding to the selected titles; and

control unit for receiving and reproducing said contents information corresponding to said selected titles from said portable audio apparatus at least by means of radio communication and outputting the reproduced information as sound from the speakers mounted in said vehicle.

10. The audio system according to claim 2, wherein said audio apparatus further comprises:

an operation switch that allows the passenger of said vehicle to input operations of said audio system; and

an operation signal transmission module for transmitting operation signals corresponding to said

operation switch to said portable audio apparatus at least by means of radio communication, and

said portable audio apparatus further comprises a CPU for controlling the own operation according to said  
5 operation signal received from said audio apparatus at least by means of radio communication.

11. The audio system according to claim 2, wherein said audio apparatus further comprises a detection unit for detecting whether a passenger of said vehicle has gotten  
10 off the vehicle or not, and

said control unit includes an erasure module for erasing information stored in said storage medium according to the detection by said detection unit that a passenger of said vehicle has gotten off the vehicle.

12. The audio system according to claim 2, wherein said audio apparatus further comprises a detection unit for detecting that said portable audio apparatus has been carried out of said vehicle, and

said control unit includes an erasure module for  
20 erasing information stored in said storage medium according to the detection by said detection unit that said portable audio apparatus has been carried out of the vehicle.

13. The audio system according to claim 2, wherein said audio apparatus further comprises a detection unit for  
25 detecting ignition OFF of said vehicle, and

said control unit includes an erasure module for erasing information stored in said storage medium according

to the detection by said detection unit of ignition OFF of said vehicle.

14. The audio system according to claim 2, wherein said audio apparatus identifies said portable audio apparatus that exists in a predetermined radio communication area of said audio apparatus and further comprises system construction unit for constructing a radio communication system made up of the identified portable audio apparatus and said audio apparatus, and

10 said audio apparatus acquires said contents information from the portable audio apparatus identified by said system construction unit.

15. The audio system according to claim 11, wherein said control unit further includes a checking module for checking whether information stored in said storage medium has been erased by said erasure module or not, and

said erasure module, when the erasure is not confirmed by said checking means, erases information stored in said storage medium again.

20 16. The audio system according to claim 12, wherein said control unit further includes a checking module for checking whether information stored in said storage medium has been erased by said erasure module or not, and

said erasure module, when the erasure is not confirmed by said checking module, erases information stored in said storage medium again.

17. The audio system according to claim 14, wherein said audio apparatus further comprises a second man-machine interface for instructing simultaneous reproduction of a plurality of contents information pieces when the plurality of contents information pieces is received from a plurality of portable audio apparatuses identified by said system construction unit, and

5 said control unit, when simultaneous reproduction is instructed by said second man-machine interface, outputs, from said speakers, at least one contents information piece from among the plurality of contents information and remotely controls said plurality of portable audio apparatuses so that other contents information pieces are reproduced by at least one of the plurality of portable audio apparatuses identified by said system construction unit.

18. A contents reproduction method of an audio system that reproduces contents information as sound in a vehicle, comprising:

20 a system constructing step of constructing a communication system constructed of portable audio apparatus carried by a passenger of said vehicle and an audio apparatus mounted in said vehicle that performs at least radio communication;

25 a contents information transmitting step of transmitting contents information pre-stored in said



portable audio apparatus to said audio apparatus at least by means of radio communication;

an information storing step of storing contents information acquired in said contents information

5 transmitting step in a recording medium of said audio apparatus; and

a sound reproducing step of reproducing said contents information stored in said storage medium and outputting the reproduced information as sound from speakers mounted  
10 in said vehicle.

19. The contents reproduction method according to claim 18, further comprising an erasing step of erasing said contents information stored in said storage medium.

20. The contents reproduction method according to claim  
15 19, further comprising a re-erasing step of checking whether said contents information stored in said storage medium has been erased or not in said erasing step and re-erasing said contents information if the erasure is not confirmed.

20 21. A contents reproduction method of an audio system that reproduces contents information as sound in a vehicle, comprising:

a system constructing step of constructing a communication system constructed of portable audio  
25 apparatus carried by a passenger of said vehicle and an audio apparatus mounted in said vehicle that performs at least radio communication;

a title information transmitting step of transmitting said title information of the contents information and its title information associated with each other, retained in said portable audio apparatus beforehand  
5 to said audio apparatus at least by means of radio communication;

an information storing step of storing the title information acquired in said title information transmitting step in a storing medium of said audio  
10 apparatus;

a selecting step of notifying titles in said vehicle according to said title information stored in said storage medium and allowing the passenger of said vehicle to select the contents information to be received from said portable  
15 audio apparatus with reference to the notified titles;

a request transmitting step of transmitting the title information corresponding to the titles selected in said selecting step to said portable audio apparatus at least by means of radio communication for the purpose of  
20 requesting the transmission of the contents information corresponding to the selected titles;

a contents information transmitting step of transmitting contents information corresponding to the title information received from said audio apparatus to  
25 said audio apparatus at least by means of radio communication; and

a sound reproducing step of receiving and reproducing the contents information corresponding to said selected titles from said portable audio apparatus at least by means of radio communication and outputting the reproduced information as sound from speakers mounted in said vehicle.

22. A contents reproduction method of an audio system that reproduces contents information as sound in a vehicle, comprising:

a system constructing step of constructing a communication system constructed of portable audio apparatus carried by a passenger of said vehicle and an audio apparatus mounted in said vehicle that performs at least radio communication;

a contents information transmitting step of transmitting contents information pre-stored in said audio apparatus to said portable audio apparatus at least by means of radio communication; and

a sound reproducing step of receiving and reproducing the contents information sent in said contents information transmitting step by said portable audio apparatus at least by means of radio communication and outputting the reproduced information as sound from said portable audio apparatus.

23. A contents reproduction method of an audio system that reproduces contents information as sound in a vehicle, comprising:

a system constructing step of constructing a communication system constructed of a plurality of portable audio apparatuses carried by passengers of said vehicle and an audio apparatus mounted in said vehicle that performs  
5 at least radio communication;

a contents information transmitting step of transmitting contents information pre-stored in a first portable audio apparatus to a second portable audio apparatus according to a control signal from said audio  
10 apparatus at least by means of radio communication;

a sound reproducing step of receiving and reproducing the contents information sent in said contents information transmitting step to said second portable audio apparatus at least by means of radio communication and outputting the  
15 reproduced information as sound from said second portable audio apparatus.

24. An audio apparatus for a vehicle mounted in a vehicle to reproduce contents information as sound in said vehicle, comprising:

20 a system construction unit for constructing a radio communication system constructed of a portable audio apparatus carried by a passenger of said vehicle and said audio apparatus;

a reception module for receiving said contents  
25 information from said portable audio apparatus at least by means of radio communication;

a storage medium for storing said contents  
information received by said reception module; and

a control unit for reproducing said contents  
information stored in said storage medium and outputting  
5 the reproduced information as sound from speakers mounted  
in said vehicle.

25. An audio apparatus for a vehicle mounted in a vehicle  
to reproduce contents information as sound in said vehicle,  
comprising:

10 system construction unit for constructing a radio  
communication system constructed of a portable audio  
apparatus carried by a passenger of said vehicle and said  
audio apparatus;

a title information reception module for receiving  
15 the title information associated with said contents  
information from said portable audio apparatus at least by  
means of radio communication;

a storage medium for storing said title information  
received by said title information reception module;

20 man-machine interfaces for notifying titles in said  
vehicle according to said title information stored in said  
storage medium and allowing the passenger of said vehicle  
to select contents information to be received from said  
portable audio apparatus with reference to the notified  
25 titles;

a request transmission module for transmitting the  
title information corresponding to the titles selected by

said man-machine interfaces to said portable audio apparatus at least by means of radio communication in order to request for the transmission of contents information corresponding to the selected titles; and

5           a control unit for receiving and reproducing said contents information corresponding to said selected titles from said portable audio apparatus at least by means of radio communication and outputting the reproduced information as sound from the speakers mounted in said  
10 vehicle.

26.   The audio apparatus for a vehicle according to claim 24, further comprising a man-machine interface for instructing simultaneous reproduction of a plurality of contents information pieces when said plurality of contents  
15 information pieces is received from a plurality of portable audio apparatuses identified by said system construction unit,

          wherein said control unit, when simultaneous reproduction is instructed by said man-machine interface,  
20 outputs, from said speakers, at least one contents information piece from among the plurality of contents information and remotely controls said plurality of portable audio apparatuses so that other contents information pieces are reproduced by at least one of the  
25 plurality of portable audio apparatuses identified by said system constructing means.

27. The audio apparatus for a vehicle according to claim 25, further comprising a man-machine interface for instructing simultaneous reproduction of a plurality of contents information pieces when said plurality of contents information pieces is received from a plurality of portable audio apparatuses identified by said system construction unit,

wherein said control unit, when simultaneous reproduction is instructed by said man-machine interface, outputs, from said speakers, at least one contents information piece from among the plurality of contents information and remotely controls said plurality of portable audio apparatuses so that other contents information pieces are reproduced by at least one of the plurality of portable audio apparatuses identified by said system construction unit.

28. A contents reproduction method of an audio apparatus for a vehicle mounted in said vehicle to reproduce contents information as sound in said vehicle, comprising:

a system constructing step of constructing a radio communication system constructed of a portable audio apparatus carried by a passenger of said vehicle and said audio apparatus;

a receiving step of receiving said contents information from said portable audio apparatus at least by means of radio communication;

a storing step of storing said contents information received in said receiving step in a storage medium; and

a sound reproducing step of reproducing said contents information stored in said storage medium and outputting  
5 the reproduced information as sound from speakers mounted in said vehicle.

29. A contents reproduction method of an audio apparatus for a vehicle mounted in said vehicle to reproduce contents information as sound in said vehicle, comprising:

10 a system constructing step of constructing a radio communication system constructed of a portable audio apparatus carried by a passenger of said vehicle and said audio apparatus;

a title information receiving step of receiving the  
15 title information associated with said contents information from said portable audio apparatus at least by means of radio communication;

a storing step of storing said title information received in said title information receiving step in a  
20 storing medium;

a selecting step of informing titles in said vehicle according to said title information stored in said storage medium and allowing the passenger in said vehicle to select contents information to be received from said portable  
25 audio apparatus with reference to the informed titles;

a request transmitting step of transmitting the title information corresponding to the title selected in said



selecting step to said portable audio apparatus at least by means of a radio communication in order to request the contents information corresponding to the selected title to be sent; and

5           a sound reproducing step of receiving and reproducing said contents information corresponding to said selected titles from said portable audio apparatus at least by means of radio communication and outputting the reproduced information as sound from speakers mounted in said vehicle.

10       30.   The contents reproduction method according to claim 28, further comprising, when a plurality of contents information is received from a plurality of portable audio apparatuses identified in said system constructing step, an instructing step of allowing the passenger of said  
15   vehicle to instruct simultaneous reproduction of those plurality of contents information pieces,

          wherein, when simultaneous reproduction is instructed in said instructing step, said audio reproducing step outputs, from said speakers, at least one contents  
20   information from among the plurality of contents information pieces and remotely controls said plurality of portable audio apparatuses so that the other contents information pieces are reproduced by at least one of the plurality of portable audio apparatuses identified in said  
25   system constructing step.

31.   The contents reproduction method according to claim 29, further comprising, when a plurality of contents

information is received from a plurality of portable audio apparatuses identified in said system constructing step, an instructing step of allowing the passenger of said vehicle to instruct simultaneous reproduction of those  
5 plurality of contents information pieces,

wherein when simultaneous reproduction is instructed in said instructing step, said audio reproducing step outputs, from said speakers, at least one contents information from among the plurality of contents  
10 information pieces and remotely controls said plurality of portable audio apparatuses so that the other contents information pieces are reproduced by at least one of the plurality of portable audio apparatuses identified in said system constructing step.

15 32. An audio system that reproduces contents information as sound in a vehicle, comprising:

a portable audio apparatus carried by a passenger of said vehicle; and

an audio apparatus mounted in said vehicle,  
20 wherein said portable audio apparatus comprises:  
contents information retaining means for retaining contents information; and

transmitting means for transmitting said contents information to said audio apparatus at least by means of  
25 radio communication, and

said audio apparatus comprises:

receiving means for receiving said contents information from said portable audio apparatus at least by means of radio communication;

storing means for storing said contents information  
5 received by said receiving means; and

controlling means for reproducing said contents information stored in said storing means and outputting the reproduced information as sound from speakers mounted in said vehicle.

10 33. An audio system that reproduces contents information as sound in a vehicle, comprising:

a portable audio apparatus carried by a passenger of said vehicle; and

an audio apparatus mounted in said vehicle,  
15 wherein said portable audio apparatus comprises:

contents information retaining means for retaining contents information and its title information associated with each other;

title information transmitting means for  
20 transmitting the title information associated with said contents information to said audio apparatus at least by means of radio communication; and

contents information transmitting means for transmitting the contents information corresponding to the  
25 title information received from said audio apparatus to said audio apparatus at least by means of radio communication, and

said audio apparatus comprises:

title information receiving means for receiving said title information from said portable audio apparatus at least by means of radio communication;

5 storing means for storing said title information received by said title information receiving means;

selecting means for notifying titles in said vehicle according to said title information stored in said storing means and allowing the passenger of said vehicle to select  
10 contents information to be received from said portable audio apparatus with reference to the notified titles;

request transmitting means for transmitting the title information corresponding to the titles selected by said selecting means to said portable audio apparatus at  
15 least by means of radio communication in order to request the transmission of contents information corresponding to the selected titles; and

controlling means for receiving and reproducing the contents information corresponding to said selected titles  
20 from said portable audio apparatus at least by means of radio communication and outputting the reproduced information as sound from the speakers mounted in said vehicle.

34. An audio apparatus for a vehicle mounted in a vehicle  
25 to reproduce contents information as sound in said vehicle, comprising:

system constructing means for constructing a radio communication system constructed of a portable audio apparatus carried by a passenger of said vehicle and said audio apparatus;

5        receiving means for receiving said contents information from said portable audio apparatus at least by means of radio communication;

storing means for storing said contents information received by said receiving means; and

10        controlling means for reproducing said contents information stored in said storing means and outputting the reproduced information as sound from speakers mounted in said vehicle.

35.    An audio apparatus for a vehicle mounted in a vehicle  
15    to reproduce contents information as sound in said vehicle, comprising:

system constructing means for constructing a radio communication system constructed of a portable audio apparatus carried by a passenger of said vehicle and said  
20    audio apparatus;

title information receiving means for receiving the title information associated with said contents information from said portable audio apparatus at least by means of radio communication;

25        storing mean for storing said title information received by said title information receiving means;

selecting means for notifying titles in said vehicle according to said title information stored in said storing means and allowing the passenger of said vehicle to select contents information to be received from said portable  
5 audio apparatus with reference to the notified titles;

request transmitting means for transmitting the title information corresponding to the titles selected by said selecting means to said portable audio apparatus at least by means of radio communication in order to request  
10 the transmission of contents information corresponding to the selected titles; and

controlling means for receiving and reproducing said contents information corresponding to said selected titles from said portable audio apparatus at least by means of  
15 radio communication and outputting the reproduced information as sound from the speakers mounted in said vehicle.

36. A computer program product that implements the operation of the audio apparatus for a vehicle according  
20 to claim 24.

37. A computer program product that implements the operation of the audio apparatus for a vehicle according to claim 25.

38. A computer program product that implements the  
25 operation of the audio apparatus for a vehicle according to claim 34.

39. A computer program product that implements the operation of the audio apparatus for a vehicle according to claim 35.
40. A computer program product that instructs the contents reproduction method according to claim 28 to be implemented in an audio apparatus for a vehicle.
41. A computer program product that instructs the contents reproduction method according to claim 29 to be implemented in an audio apparatus for a vehicle.
42. A computer-readable storage medium that stores program codes that implement the operation of the audio apparatus for a vehicle according to claim 24.
43. A computer-readable storage medium that stores program codes that implement the operation of the audio apparatus for a vehicle according to claim 25.
44. A computer-readable storage medium that stores program codes that implement the operation of the audio apparatus for a vehicle according to claim 34.
45. A computer-readable storage medium that stores program codes that implement the operation of the audio apparatus for a vehicle according to claim 35.
46. A computer-readable storage medium that stores program codes that implement the contents reproduction method according to claim 28 in an audio apparatus for a vehicle.
47. A computer-readable storage medium that stores program codes that implement the contents reproduction

method according to claim 29 in an audio apparatus for a vehicle.